Copy

BASIN ELECTRIC POWER COOPERATIVE

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November 9, 2006

Mr. John Dwyer, Chairman
Lignite Research Council
1016 E. Owens
PO Box 2277
Bismarck, ND 58502

RE: Amendment to Contract FY05-LI-129

Dear Mr. Dwyer:

I am writing to ask consideration from the Lignite Research Council to amend contract FY05-LI-129, "Lignite Coal Test at a Transport Reactor Gasification Facility in Wilsonville, AL" to include an additional $90,000 in funding.

Originally the grant provided for a 250 hour test followed by a 1,000 hour test at the Power System Development Facility (PSDF) in Wilsonville, AL. In an April 21, 2006 letter, PSDF Director Randall Rush advised us that a 750 hour test was necessary to gain comfort with operations in the newly modified PSDF configuration before conducting the 1,000 hour test. This 750 hour test will be completed in November 2006. The 1,000 hour test on high sodium coal is scheduled for February 2007 with the PSDF operating in air blown mode. In addition, the North Dakota Lignite IGCC Team and the Department of Energy have requested approval for an additional 1,000 hour test on high sodium lignite with the PSDF in oxygen mode. By having both air and oxygen modes tested, the PSDF can be thoroughly investigated for use with high sodium lignite.

The additional funding is needed because two additional tests will be performed at the PSDF. The funding would support additional coal purchase, railroad transportation, transloading, and trucking to move lignite coal to the Wilsonville, AL test facility (new budget enclosed).

The transport reactor has the potential to operate on high sodium lignite and provide the lignite industry with an option for future IGCC and coal-to-liquids application in North Dakota.

Thank you for your consideration.

Sincerely,

Michael W. Paul, P.E.
Vice President, Engineering & Construction

/sh
Enclosures
cc: Curtis Jabs (w/o enclosures)

Budget

Original Itemization:

3700 tons coal @ $10/ton	$3700.00
Shipping 500 tons for 250 hour test	$25,000.00
Shipping 3200 tons for 1000 hour test	$160,000.00
Consultant Fees	$5,000.00
Coal transfer (nearest load out to test facility)	$50,000.00
Misc. (additional coal, shipping, transfer)	$6,300.00
Total	$250,000.00

Revised Itemization:

250 hour test (actual)	$32,450.00
750 hour test (actual)	$106,470.00
1,000 test-air blown (projected costs)	$141,960.00
1,000 test –Oxygen blown (Projected)	$141,960.00
Misc. (shipping, coal, consultant fees)	$7,160.00
Total	$430,000.00

A projected shortfall of $180,000 thus request for $90,000 in matching funds.

A likely timetable scenario for the revised test schedule:

250 hour test (complete)	June, 2005
750 hour test	Nov, 2006
1,000 hour test – high sodium (air blown)	Feb, 2007
1000 hour test –high sodium (oxygen)	April, 2007
Evaluation overview – Wilsonville	Mid 2007
Final Report	Late 2007

Randall E. Rush
Director
Power Systems
Development Facility
Research & Environmental
Affairs

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SOUTHERN COMPANY
Energy to Serve Your World℠

April 21, 2006

Jeff Burgess, P.E., Director
Research and Development Program
Lignite Energy Council
P. O. Box 2277
Bismarck, ND 58502

Dear Jeff,

We appreciate your letter of March 28th and the Lignite Energy Council's continued interest in ongoing technology development at the Power Systems Development Facility. Transport gasifier modifications are proceeding and are expected to be complete in July. After commissioning tests are completed, a test with PRB in air-blown mode and oxygen-blown mode is expected to begin in late summer. This test is planned to last 750 hours, but the length may be shorter or longer depending on the pace at which we gain comfort with operations in the new configuration. In preparation for a long-term test with high-sodium lignite, we currently plan to complete a test of nominally 750 hours with both low- and high-sodium lignite in air-blown mode in the fall. A 1000-hr test with high-sodium lignite in air-blown mode is scheduled for early 2007. The order of and approach to this testing is based on suggestions in your letter, conversations with Mike Paul of Basin Electric, and recent conversations with the Department of Energy (DOE). A summary of the test schedule is enclosed.

During these tests the gasifier and particulate filter will be characterized over a range of conditions to optimize process performance and maximize carbon conversion. The gasifier temperature and pressure differential profiles and solids samples will be closely monitored. A key issue during high-sodium lignite testing will be to evaluate the potential of agglomerate formation. Additional objectives will include evaluation of the coal feed and ash removal system's operation and performance. Following each run, a detailed gasifier and particulate filter inspection will be performed. All observations and results will be documented and discussed in a meeting at the PSDF following the run. As we begin development of the detailed test plan we will welcome input from representatives of your organization.

Your letter also mentioned some specific expectations related to guarantees for a commercial plant that might follow successful testing of high-sodium lignite. Southern Company and KBR are in the process of finalizing our commercialization strategy for coal-to-power and coal-to-chemicals based on transport reactor integrated gasification (TRIG™) technology. In our respective businesses as a power plant owner/operator and as a world-scale supplier of chemical and energy technology both Southern and KBR appreciate that commercial issues will be critically important to customers of TRIG™ technology. It would be premature to comment in detail on commercial issues, but we are confident that the relevant issues can be dealt with when specific projects are discussed in the future.

Again, I thank you for taking the time to formally express the Lignite Energy Council's interest in the work at the PSDF. I believe that our relationship has been mutually beneficial and expect that future work will benefit not only our respective organizations, but the DOE and the Nation as a whole.

Sincerely,

cc: Mike Paul

Lignite Energy Council
PO Box 2277
Bismarck, ND 58502
Telephone: (701) 258-7117
Fax: (701) 258-2755

March 28, 2006

Randall Rush, Director
Power Systems Development Facility
Southern Company Services, Inc.
Highway 25 North
PO Box 1069
Wilsonville, AL 35186

Dear Randall:

The North Dakota lignite industry IGCC Team was encouraged during our December 2, 2005 dinner meeting and discussion about Southern Company and KBR's intent to commercialize the TRIG gasifier for power and F-T liquids. The team was also encouraged that the high-sodium lignite test has been rescheduled targeting the 4th quarter of 2006 – 1st quarter of 2007. We understand that on-going modifications will address properties of Fort Union lignite, and that shakedown and a long-term PRB test will be conducted to compare TRIG performance to previous PRB tests, prior to the lignite test.

During a recent IGCC team meeting, our members discussed TRIG performance and information needed for industry engineers' to fully evaluate a Fort Union, high-sodium lignite using this technology. Following are some of our industry engineers' expectations for information to further support evaluation of the TRIG technology for high-sodium North Dakota lignite applications:

- Continuous air-blown 1,000-hour test using lignite with sodium levels ranging from 8 % to 12 % at operation parameters that would be representative of chemical and thermal equilibriums anticipated in commercial practice. Requested information includes:
  - The 1000-hour test duration should represent chemical and thermal equilibriums.
  - Characterize coal feed operation and performance.
  - With respect to optimizing performance, characterize gasifier temperatures, coal feed, ash fluidization-recycle flows, operation of the particulate filters and pressure drop.
  - Following the test completion, visual inspection of critical area should be conducted to evaluate agglomerates due to the high-sodium lignite.
  - Unburned carbon: less than 5%.

- Detailed chemical analyses of chemical and coal input spanning test initiation and steady state duration.
  - Syngas chemical composition prior to combustion and pollutant emission levels.
  - Detailed energy and mass flows of inputs and outputs.
  - Agglomeration growth (as a function of time) in the combustion zone and circulation/recycle loop, and agglomerate deposits in duct passages, and methods to minimize agglomeration and deposition.

- Commercial expectations:
  - Air-blown TRIG for power generation with Heat Rate efficiency of 36% to 38% with gas quality and composition suitable for a commercially available combustion turbine.
  - Full vendor commercial guarantee wrap (including operation with high-sodium levels)
  - Capacity of 95 %, availability of 90 %.
  - Unburned carbon less that 5 %.
  - Emissions are environmentally compliant.
  - Adaptable for economically competitive carbon dioxide removal.
  - SCS/KBR commercialization strategy.
  - ND lignite application economics.

Following completion of the high-sodium lignite test, the IGCC team respectfully requests a detailed report and meeting at your PSDF facility to discuss and review the test results and impacts on equipment (if any). In summary, our lignite industry engineers remain very interested in the TRIG gasifier as an option for future IGCC and coal-to-liquids applications and look forward to the upcoming lignite test.

If you have questions of our information expectations and needs, please call Mike Paul at (701) 355-5691 or me at (701) 258-7117.

Sincerely,

Jeff Burgess, P.E., Director
Research & Development Program
Lignite Energy Council